Attention decrement, temporal variation, and the primacy effect in impression formation

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Three experiments which tested the attention decrement explanation of the primacy effect in impression formation are reported. A memory-crowding interpretation of attention decrement would predict a decrease in primacy as the interval between traits is increased. Mild support was obtained in Experiment I but not in II or III. Overall, the magnitude of the primacy effect was independent of intertrait temporal variation. Decrement in attention is the most attractive theoretical explanation for the commonly obtained primacy effect. However, the results of the present series of studies suggest that this explanation is not tenable and that other theoretical mechanisms will be required to account for primacy effects.

Experiments in impression formation using the Asch (1946) paradigm of serial presentation of trait words have typically found a primacy effect. Several explanations for the effect have been proposed, including change in meaning (Asch, 1946), attention decrement (Anderson, 1965), and inconsistency discounting (Anderson & Jacobson, 1965; Anderson, 1968b). None of the explanations has received solid confirmation. In addition, it now seems that a primacy effect appears only under certain limited conditions, primarily when Ss are asked to give one final evaluative response at the end of the stimulus set. Recency effects (or no effects) have been obtained when Ss must give an updated evaluation as each trait is presented (Stewart, 1965), when concomitant recall of the traits is required (Anderson & Hubert, 1963), or when pronunciation of the traits as they are presented is required (Anderson, 1968b; Hendrick & Costantini, 1970).

In two experiments using adjective sets carefully constructed to vary in amount of inconsistency, Hendrick and Costantini (1970) found no evidence that the primacy effect is due to inconsistency discounting. However, they did find that the primacy effect became a significant recency effect with the simple response requirement of having Ss pronounce each word as it was presented. These results were interpreted as supporting the attention decrement hypothesis. Presumably the pronunciation requirement led to a redistribution of attention across the traits in a set with some overweighting of the most recent traits, leading to a recency effect.

Thus, the hypothesis of attention decrement is the most viable explanatory contender at present, even though the evidence is not strongly compelling. The

present research was concerned with a variable relevant to one interpretation of the attention explanation, the interstimulus interval between traits in a sequence. This interval has not been controlled very precisely in previous research, and it has not been varied systematically. Researchers usually report an interval of approximately 1 to 3 sec.

The temporal interval between traits might affect the primacy effect for several reasons. If the interval is very short, Ss may have increasing difficulty in registering and rehearsing later stimuli in the sequence, because processing of the initial stimuli takes all of the available time. This memory-crowding hypothesis would generally predict a primacy effect which gradually decreases as the time interval between stimuli is increased. This interpretation of attention decrement views the required decrease in weight across serial positions in a sequence as due simply to progressive inability to process the stimuli properly.

Secondly, if formation of an impression requires some minimal rehearsal of the stimuli, lengthening the time interval should lead to better rehearsal, and hence better integration of the stimuli. Thus, at some critical interstimulus interval, the magnitude of the primacy effect should approach zero and perhaps become a recency effect.

This reasoning suggests that the attention decrement hypothesis would predict a decreasing primacy effect as the interstimulus interval is increased. At the same time, findings of robust primacy effects which are independent of interstimulus intervals would cast doubt on the decrement interpretation. Three experiments are reported which attempted to assess this interpretation. Ss evaluated hypothetical stimulus persons described by sets of six trait adjectives. In the several studies, the time interval between traits varied from essentially 0 to as long as 5 sec. The magnitude of the primacy effect as a function of this temporal variation was the critical variable of interest.

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Table 1
Mean Primacy-Recency Effects in the Three Experiments

Experiment I (N = 28 Per Cell)			
Time Intervals (Sec)			
	1.0	1.8	4.0
	+ .96 ^{a**}	+ .62 ^{b**}	+ .46 ^{b**}
Experiment II (N = 12 Per Cell)			
Time Intervals (Sec)			
Response Condition	1.8	5.8	Mean
No Repeat	+ .50*	+ .70*	+ .60**
Repeat	-.19	+ .16	-.02
Experiment III (N = 30 Per Cell)			
Time Intervals (Sec)			
	1.0	4.0	5.8
	+ .43**	+ .75**	+ .65**

*Significant at .10 level

**Significantly different from zero at the .05 level

Note—Means in Experiment I with no subscripts in common differed at the .05 level by the Newman-Keuls test.

EXPERIMENT I

Method

Eighty-four students (22 males, 62 females) from an introductory psychology course served individually as Ss. Two male graduate students served as Es. When a S arrived at the scheduled time, the nature of the impression task was explained and the E then proceeded to read the adjective sets to him. The S gave his response to each set on an 8-point scale. A replica of the scale was placed in front of the S, and each number was given an appropriate designation, ranging from "highly favorable" under 8 to "highly unfavorable" under 1. Ss were told that each adjective in a set was contributed by a different individual who knew the person and that perfect consistency in the description should not be expected.

Experimental Conditions

The Ss were assigned randomly to one of three conditions which differed only in the length of time between the presentation of traits in a set. The E paced himself by listening to tape-recorded beeps through an earphone. The beeps were not audible to Ss. The time intervals between beeps were 1.0, 1.8, or 4.0 sec. The length of time required to present a trait orally averaged about .8 sec. Thus, the effective intertrait interval in the three conditions was about .2, 1.0, and 3.2 sec, respectively. A given S served in only one time condition.

Stimulus Sets

The stimuli were eight sets of six traits used previously (Hendrick & Costantini, 1970, p. 161). These sets were designed so that for half the sets there was strong affective inconsistency between high and low desirable traits, but only minimal inconsistency in the remaining half of the sets. Each set was presented in a high-low and low-high order. In addition, there were three warm-up sets and eight filler sets, so that, altogether, a S rated 27 sets. Several different random orders of presentation of the sets were used.

Results and Discussion

A difference score between the high-low and low-high orders of presentation was obtained for each set. There were four such scores for the affectively inconsistent sets and four for the consistent sets. The four scores of each type were averaged to yield two primacy-recency scores for each S. These scores were analyzed in a 2 (Es) by 3 (intertrait intervals) by 2 (set consistency) analysis of variance. The only significant effect was due to time intervals ($F = 4.98$, $df = 2/78$, $p < .01$). The mean primacy scores are shown in the top part of Table 1. Primacy effects were obtained in each of the three time conditions, and each of these effects was significantly greater than zero. The relative difference in magnitude of the primacy effect is the main point of interest. The Newman-Keuls comparisons indicated that the primacy effect of +.96 in the 1.0-sec condition was significantly larger than the other two means, which did not differ significantly from each other.

The results provided some support for the memory-crowding hypothesis, since there was greater primacy at the shortest intertrait interval than at the other two intervals. This support is qualified, however, by the fact that at the longest interval, 4.0 sec, a significant primacy effect still obtained, and this effect did not differ from that for the 1.8-sec condition. Also, the mean of .96 for the 1.0-sec condition seemed relatively high. There were no unusually high individual scores that might account for this large mean, however, and, in fact, 27 of the 28 Ss in this condition showed an overall primacy effect.

Because of this possible ambiguity in interpretation of the data, a second experiment was conducted. Two variables were manipulated: intertrait time interval and response requirements imposed on the Ss. Half the Ss merely gave an impression rating at the end of each adjective set, but the other half was required to pronounce each adjective as it was presented, as in Hendrick and Costantini (1970, Experiment II). The latter requirement had previously produced powerful recency effects.

EXPERIMENT II

Method

Essentially the same procedures and stimulus sets were used as in the first experiment. Ss were 48 students (approximately 16 males and 32 females) from an introductory psychology course. A female E collected data from 32 Ss and a male E collected data from 16 Ss. Half the Ss repeated each adjective immediately after the E spoke it, and the other half did not. Half the Ss received an intertrait interval (between beeps) of 1.8 sec and the other half received an interval of 5.8 sec. The 1.8-sec interval was just about the shortest possible which allowed both the E and Ss in the repeat condition to pronounce the word. The 5.8-sec interval seemed phenomenally quite long.

Results and Discussion

Analysis of variance indicated that the only significant effect was due to the response requirement. As shown in Table 1, Ss in the no-repeat condition had a mean primacy score of +.60, while Ss in the repeat condition had a mean of -.02 ($F = 5.21$, $df = 1/44$, $p < .03$). This result replicates the finding of Hendrick and Costantini (1970), except that they obtained significant recency effects in the repeat condition. In the present study, only the primacy effect of +.60 in the no-repeat condition differed significantly from zero.

The time effect found in the first experiment was not replicated in Experiment II. In fact, in the no-repeat condition, the primacy effect of +.70 in the 5.8-sec condition was larger, though not significantly so, than the effect of +.50 in the 1.8-sec condition.

The impression data of the second experiment cast doubt on the memory-crowding interpretation of the attention decrement hypothesis. Two effects were replicated from previous work: degree of affective consistency of a set of traits had no effect on impression ratings, and the response requirement of pronunciation had a powerful effect.

In an attempt to obtain closure on the effect of intertrait temporal variation, a third experiment was conducted which used a wide variation in time intervals.

EXPERIMENT III

Method

The same procedure and adjective sets were used as in the two previous experiments. Ss were 90 introductory psychology students (45 males, 45 females). There were three Es (2 males, 1 female), and each saw 30 Ss. Sex of Ss was balanced over Es and time conditions. The time intervals were 1.0, 4.0, and 5.8 sec. Only the standard procedure of a final evaluative response was used; no other response requirements were imposed.

Results and Discussion

The mean primacy effect for each of the three intertrait time conditions is shown in Table 1. Each of these primacy effects was significantly greater than zero. There were no significant differences between the means, and none of the effects in the analysis of variance was significant.

The balance of the results for the three experiments suggests that variation in the time interval for trait presentation had no systematic effect on the magnitude of the primacy effect. The effect obtained in Experiment I was probably due to sampling variation, since the mean of +.96 for the 1.0-sec condition was only +.43 for the same condition in Experiment III. For the eight no-repeat conditions in the three experiments, the mean primacy effect was +.63. This value is quite

close to that reported by Hendrick and Costantini (1970), as well as other investigators. It may be concluded that variation in intertrait time has a minimal influence on the primacy effect. The 1.0-sec interval was about the shortest possible for oral presentation, while the 5.8-sec interval seemed almost embarrassingly long, certainly long enough to exclude a memory-crowding hypothesis. It would seem, then, that the memory-crowding interpretation of attention decrement is untenable.

One point remains to be clarified. The theory of information integration developed by Anderson (1968a, 1970, 1971) assumes two basic parameters: a scale value S and a weighting factor w for each stimulus item. In a serial presentation task, a decrement in weights across serial positions is necessarily required before a primacy effect can be obtained. This mathematical requirement of a weight decrement is "neutral" with respect to a psychological explanation for why the weight decrement occurs. The present research explored one such explanation, the memory-crowding hypothesis. Since this explanation appears not to be tenable, it will remain for future research to explore other possible explanatory mechanisms.

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